Math 3C Fall 2014
Pre-lecture 2-2 Due: Beginning of lecture-Wednesday, October 15.

This is to be done on your own paper. Please write your name (last name first) on the top right corner along with your discussion section number (B02, B03 etc) and "pre-lecture [number]" (in this case "pre-lecture 2-2").

This will be graded on effort and thoughtfulness, not on correctness. With that said, do not feel obligated to write more than necessary. This is intended for you to work on your own.

1. Start with the function $f_1(x) = x^3$. You will be transforming the function in the next few steps. You do not need to draw the graphs, but you can if you think it will help.

   (a) Shift the function $f_1(x)$ **vertically** 4 units up to get a new function $f_2(x)$. What is $f_2(x)$?

   (b) Now shift the new function $f_2(x)$ **horizontally** 3 units to the left to get a new function $f_3(x)$. What is $f_3(x)$?

2. Start with the function $g_1(x) = x^3$.

   (a) Shift the function $g_1(x)$ **horizontally** 3 units to the left to get new function $g_2(x)$. What is $g_2(x)$?

   (b) Now shift the new function $g_2(x)$ **vertically** 4 units up to get a new function $g_3(x)$. What is $g_3(x)$?

   (c) Now compare $f_3(x)$ from question 1 to $g_3(x)$. What do you notice? Can you conclude anything?

3. Start with the function $h_1(x) = \sqrt{x}$.

   (a) Stretch the function $h_1(x)$ **vertically** by a factor of 3 to get a new function $h_2(x)$. What is $h_2(x)$?

   (b) Shift the function $h_2(x)$ **vertically** 2 units up to get a new function $h_3(x)$. What is $h_3(x)$?

4. Start with the function $k_1(x) = \sqrt{x}$.

   (a) Shift the function $k_1(x)$ **vertically** 2 units up to get a new function $k_2(x)$. What is $k_2(x)$?

   (b) Stretch the function $k_2(x)$ **vertically** by a factor of 3 to get a new function $k_3(x)$. What is $k_3(x)$?

   (c) Now compare $h_3(x)$ from question 3 to $k_3(x)$. What do you notice? Can you conclude anything? Is this the same or different compared to part c from question 2?